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Arthritis in Lambs in New Zealand.

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Little would be known of this disease if it were not for the fact that it is a heavy source of " partial condemnations " at freezing works throughout the country.

Stifle, hock and knee, in the order given, are the most commonly affected joints, and when the infection is present the limb involved is condemned. The loss through this is somewhat large in the aggregate, and, moreover, there is additional loss, inasmuch as the remainder of the carcass is no longer exportable and has to be disposed of by other and less profitable means.

The point of greatest economic importance, however, is that affected animals are unthrifty and take far longer to get into condition for killing. If a farmer has a large number affected, the financial loss involved in the longer fattening period is a considerable one.

In view of these facts, it was thought desirable to investigate the condition with a view to discovering: (1) the causative organism, (2) its path of entrance into the body. It might then be possible to determine whether preventive measures could be based on the knowledge forthcoming from (1) and (2). Curative measures are obviously impossible.

The work was commenced in the early part of 1927, and has now reached a stage where it seems desirable to publish the results in the hope that they will be of service to others who may be engaged in similar work.

Part I.—The Causative Organism.

Prior to this investigation no concerted effort to determine the cause of this disease seems to have been made in New Zealand. A few cases had been investigated from time to time, but the results obtained were inconclusive.

Staphylococcus aureus was considered a likely cause from its having occurred fairly often in cultures from affected joints. Intravenous injection of a culture into a lamb, however, did not set up joint lesions in the animal, nor cause lameness at any period of the experiment. It was therefore decided to have specimens forwarded from freezing works and abattoirs situated in widely separated parts of the North and South Islands so that a comprehensive study of the flora of affected joints could be made.

At first, the unopened joints themselves were sent to the laboratory, but this was found highly unsatisfactory —the bacterial flora was so heavy and varied and contained such rapidly-growing species of cocci that satisfactory results were obviously unobtainable by this means. One of us then visited a local freezing works and collected fluid from affected joints in pasteur pipettes. In this fluid the organism regarded as responsible for the diseased condition was found, and supplies of pipettes with instructions for their use were sent out forthwith to selected freezing works, where cases were known to be of common occurrence.

The organism mentioned, a member of the " diphtheroid group," is described below, but it is convenient to give here the results obtained by culturing from the pipettes which were received during the summer of 1927 from the various works.

TABLE I.

Total Pipettes.	Sterile.	Diphtheroid in pure culture.	Other organisms often including diphtheroids.
75	27	36	12

Description of Organism.

It is about 1·5 to 2·5μ long and ·5μ broad; gram-positive; non-motile; non-sporulating; and when seen in smears from affected joints (but usually not otherwise) is decidedly beaded. The growth on serum is in the form of minute, non-liquefying, colourless, round, smooth colonies resembling those of many streptococci. It grows in beef broth, causing in 18 hours a slight haziness which never becomes much denser.

On agar and lactose-agar the growth is poor; on glucose-agar it grows fairly well, the growth again resembling that of streptococci.

For surface colonies the best medium in our hands is casein agar, on which the individual colonies may attain a diameter of 2 mm. in 18 hours. If incubated further they do not increase in size but become thicker and somewhat wrinkled, though remaining soft and moist. Cultures are non-chromogenic. Milk is unchanged after 14 days.

The most interesting cultural characteristic is its mode of growth in gelatine stab at 22° C. After about four or five days there is a beaded growth along the entire length of the stab. After about ten days it was found that several cultures had grown out from the stab into the surrounding medium, giving the " bottle brush " appearance depicted by Hutyra and Marek as characteristic of *Bacillus erysipelatis suis*. In some cultures only a few colonies of the many along the stab-track had grown out in this way, while in others none showed this tendency and the growth remained beaded throughout. It was thought that this might indicate the presence of "rough" and " smooth " types of the organism, and, judging from the agglutination results shown in Table II on page 920, this seems to be probable. On subculturing from an apparently pure beaded type, all three types of culture (beaded, bottle-brush and mixed) were obtained, and the same applied to apparently pure bottle-brush cultures.

Carbohydrate reactions were tried, using Hiss serum

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water in place of peptone water, since the latter would not sustain growth, but were, as is usual with the diphtheroid group, unsatisfactory and it is intended to repeat them. All that can be said on this phase of the work at present is that of 18 strains tested, 18 fermented glucose, 13 fermented lactose, 12 galactose, and none saccharose or maltose.

On the surface of blood agar the organism is weakly hæmolytic, the hæmolysis being of the beta type.

Method of Isolating the Organism.

Our experience was that, in pipettes forwarded from affected joints, it was usually impossible to detect any organisms in direct smears, owing to their being present in very small numbers at that late stage of the disease. We therefore made a practice of inoculating tubes of extract broth with several drops of the pipette contents. These tubes were then incubated for about 18 hours and subsequently used for the inoculation of serum or casein agar slopes. By this means it was generally found possible to obtain isolated colonies on the slopes at the first attempt, provided the organism was present in the original material.

Joint Lesions met with at Freezing Works.

There was a varying degree of distension of the joint capsule, the contents being cloudy and more viscid than normal. Flakes of greenish pus were present in the more acute cases, accompanied by a fibrinous deposit on the inner surface of the joint capsule. The bony components were enlarged.

On boiling till all the soft tissues were removed, the articular surfaces of the bones showed marked erosion and a pitted appearance. This was particularly noticeable in the hock and knee joints. A striking feature in connection with the bones in these cases is their extraordinary lightness and the ease with which they can be crushed with the hand. It is intended, if possible, to go into the matter further, since, should there be any deficiency present, it may be a very important factor in predisposing to infection.

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The pathogenicity of the organism was tested in several ways as follows :—

Experimental Infection of Sheep.

Experiment I, 9.3.27.—A seven months, cross-bred, Romney lamb was given an intravenous injection of 1 c.c. thin emulsion of the diphtheroid organism described above. *14.3.27.*—Animal acutely lame, left hind. *14.3.27* to *20.3.27.*—Between these dates the lameness passed from left hind to right fore, then back to left hind, and gradually disappeared.

Experiment II, 3.5.27.—Three ewes were inoculated as follows with a different strain of the organisms :—

Ewe 73.—2 c.c. broth culture subcutaneously, right thigh ; she was lame in inoculated leg during subsequent three or four days, after which no ill effects were ever seen. No local abscess occurred at site of injection.

Ewe 74.—2 c.c. broth culture intravenously ; no result.

Ewe 75.—2 c.c. broth culture intravenously ; was noticed on *5.5.27* to be lame right hind ; *12.5.27*, apparently sound on right hind, but very lame left fore ; *15.5.27*, left fore sound, but right hind again lame. The lameness now remained in the right hind, gradually diminishing till, by *25.5.27*, she was going sound.

Agglutination Reactions.—The blood of the lamb inoculated intravenously on *9.3.27* was tested for specific agglutinins on *10.6.27* using the blood serum of a normal lamb as a control. The sera were put up against two antigens—one prepared from the strain used in the inoculation, and the other a strain isolated from quite a different part of the country. The result is shown in Table II.

Table II.

Serum.	Antigen.	Titre. 1 : 12·5	1 : 25	1 : 62·5	1 : 125	Control
Healthy lamb	Strain W.	—	—	—	—	—
	Strain F2	—	—	—	—	—
Lamb given intravenous injection of Strain W.	Strain W.	xxx	xxx	x	—	—
	Strain F2	xx	xx	—	—	—

Experimental Infection of Guinea-Pigs.

In addition to noting the effect of the organism on sheep, it was decided to inoculate guinea-pigs in the hope that in them would be found a suitable, and therefore handier and cheaper, experimental animal than the sheep. Although our hopes were not fulfilled, the result of the experiment is worth recording.

Four guinea-pigs were inoculated on *21.3.27* with ½ c.c. each of a suspension of the organism. Results were as follows :—

No. 1.—Adult male, subcutaneous injection, right thigh. *7.4.28*, animal apparently healthy but had wasted considerably. *Post-mortem* examination showed no lesions in the joints or elsewhere.

No. 2.—Adult male, intra-peritoneal injection. *7.4.28*, animal very emaciated, dull and listless, but *post-mortem* showed no lesions in joints or elsewhere ; cultures from spleen and peritoneum negative.

No. 3.—Pregnant doe, intra-peritoneal injection. *7.4.28*, animal dull, markedly wasted and had aborted. Apparently the fœtuses were eaten, as no trace was found. *Post-mortem* examination showed no lesions. Uterus not yet entirely involuted and small quantity of débris present in uterus and vagina. Cultures negative, except for various cocci in uterus and vagina.

No. 4.—Pregnant doe, intra-peritoneal injection. *7.4.28*, identical with No. 3, but uterus contained a reddish-brown pus-like exudate. Here again cocci were present but no diphtheroids could be discovered.

Thus it seems that guinea-pigs are able to overcome more or less heavy doses of this organism, but at considerable cost to themselves. The abortion occurring in the females may have resulted from toxæmia or from the organism invading the uterus before it was finally overcome. It is interesting to note in this connection the findings of Jowett (*Journal of Comp. Path. and Ther.*, Vol. 38), when investigating the effect on pregnant rabbits of *B. pyogenes* from bovine mastitis. He found that if the rabbit were pregnant, or had recently been so, this organism appeared to have a predilection for invading the uterus. *B. pyogenes* is a member of the same group as the organism with which we

are working, and in our hands has also resembled it in its ability to cause an arthritis when inoculated into the blood stream of lambs.

Experimental Infection of Rabbits.

Rabbits were used as well as guinea-pigs for inoculation purposes but, in view of a shortage of them at that time, we were unable to spare any pregnant does. Prior to the commencement of this investigation one of us had isolated a strain of *B. pyogenes* from the membranes and aborted fœtus of a ewe. The organism resembled the *B. pyogenes* sp. found in some cases of bovine mastitis and was a serum liquefier.

The rabbits were inoculated intravenously on *28.4.27* with ½ c.c. of a thin suspension of organisms as follows :—

(1) Diphtheroid from aborted ewe.
(2) Strain F3 from a case of arthritis.
(3) Bovine mastitis strain.

No. 3 remained quite unaffected; the strain used had undergone artificial culture for some time and had probably lost much of its original virulence.

No. 1 was noticeably weak on *7.5.27* and was found dead on *10.5.27*. No lesions were found at autopsy and cultures were negative. This strain had also been subcultured for some time.

No. 2 was found dead, *3.5.27*. Autopsy revealed petechiæ on the epicardium, the base of the inoculated ear inflamed, swelling of the spleen and petechiæ on the epicardium. Smears of heart blood showed no organisms, but on serum culture the inoculated organism was recovered in pure culture.

On *5.5.27*, rabbit No. 4 received a similar intravenous inoculation of strain F5 from an arthritis case. It was noticeably ill on *10.5.27*, but recovered and showed no further ill effects.

The results obtained with both guinea-pigs and rabbits suggest the formation by the organism of a toxin, but this has not yet been submitted to experimental trial.

Part II.—The Path of Infection.

Experiments on Pregnant Ewes.

It was now decided to inject ewes that were about two months' pregnant with *B. pyogenes* sp. from an aborted ewe, and with a strain from an arthritis case. Our object was twofold—(1) to see if abortion could be induced and (2) to see if arthritis would occur in the lambs born of infected ewes.

Inoculations were carried out as follows on *3.5.27* :—

Ewe 70.—1½ c.c. emulsion of aborted ewe strain (*B. pyogenes* sp.) intravenously.

Ewe 71.—1½ c.c. emulsion of aborted ewe strain (*B. pyogenes* sp.) intravenously.

Ewe 72.—1½ c.c. emulsion of aborted ewe strain (*B. pyogenes* sp.) intravenously.

See also page 920

Ewe 73.—2 c.c. arthritis strain F3 subcutaneously.
Ewe 74.—2 c.c. arthritis strain F3 intravenously.
Ewe 75.—2 c.c. arthritis strain F3 intravenously.

The results were :—

Ewes 70 and 72 showed no ill-effect; lambs normal till sold off at four months old.

Ewe 71 was noticed on *13.5.27* holding the head somewhat stiffly. This gradually became worse till on *11.7.27* she was paraplegic and was destroyed. *Post-mortem* notes on the case are as follows :—

Abscess containing green pus two inches behind right ear had broken outwardly. Sinuses connected the abscess with the occipito-atlantoid articulation, where another abscess had formed superiorly, causing erosion of the cartilage on the occipital condyles. There was slight local meningitis. Sinuses extended upwards into the occipital insertion of the complexus muscle and a string of small abscesses were present under the basi-occiput and sphenoid, ending at the upper posterior portion of the pharynx. Twin lambs were present, but cultures from them and from the fœtal membranes were sterile. The pus in the abscesses present was thick and greenish, resembling that of caseous lymphadenitis in an early stage. No organisms were seen in smears, but cultures gave a pure growth of the inoculated organism.

Ewe 73.—No ill-effect on ewe; lamb normal till sent off fat.

Ewe 74.—No ill-effect on ewe; it gave birth to twins on *25.8.27*. One of these was normal and eventually went away fat. The other had evidently "scoured" *in utero* and was covered with a yellowish fæcal matter at birth. It never thrived well but showed no lameness or joint enlargement. It was killed on *20.12.27*, but *post-mortem* showed no lesions other than a few degenerated hydatids in the liver. Cultures from these were negative.

Ewe 75.—Lambed during night of *27.8.27*. Found in morning unable to complete lambing owing to posterior presentation. Assistance was given, but lamb was born dead. It was apparently a normal lamb and all cultures from it were negative.

The following table shows the results of agglutination tests on these six ewes, with a normal sheep's blood as control :—

Table III.

Animal No.	Aborted ewe strain. 1/12½	1/25	1/62½	1/125	Control.
70	xxx	xxx	xxx	xxx	o
71	xxx	xx	x	o	o
72	xxx	xxx	xxx	xx	o
73	xxx	xxx	xxx	xx	o
74	xxx	xxx	xxx	xxx	o
75	o	o	o	o	o
Normal Sheep.	xxx	x	o	o	o

Animal No.	Arthritis Strain (bottle brush type in gelatine). 1/12½	1/25	1/62½	1/125	Control.
70	?	o	o	o	o
71	xx	x	o	o	o
72	x	x	o	o	o
73	xxx	xx	?	o	o
74	xxx	xx	o	o	o
75	xxx	xx	x	?	o
Normal Sheep.	x	o	o	o	o

Date of test, *1.7.27*.

Animal No.	Arthritis Strain (beaded type in gelatine). 1/12½	1/25	1/62½	1/125	Control.
70	o	o	o	o	o
71	o	o	o	o	o
72	o	o	o	o	o
73	o	o	o	o	o
74	o	o	o	o	o
75	o	o	o	o	o
Normal Sheep.	o	o	o	o	o

The apparently complete absence of antigenic value in the " beaded " type is rather striking, and more work will be done on this aspect of the matter when time permits.

The Possibility of Navel Infection.

Since the organism found has a predilection for the joints when it gains entry to the circulation, we thought it advisable to investigate the chances of infection taking place through the freshly ruptured navel, and as organisms of this group are almost ubiquitous it seemed possible that the navel might become contaminated from the ewe's vagina during birth. For this reason, two ewes that were within a few days of lambing were selected and each received emulsions of the arthritis organisms into the vagina. Five c.cs. of a fairly thick suspension was injected on each occasion.

Ewe 80.—Vagina injected on *23.8.27*, *25.8.27* and *27.8.27*. It lambed on *28.8.27*. The lamb was normal and remained so till it was sent off fat.

Ewe 79.—Vagina injected on *27.8.27*, *29.8.27*, *5.9.27*, *7.9.27*. Lambed twins on *8.9.27*. Lambs normal and remained so till sent off fat.

In addition, artificial infection of the freshly ruptured navel was attempted as follows :—

Ewe 81 gave birth to a normal lamb. As soon as born it was caught and the navel string dipped in a test tube containing a heavy emulsion of the organism. The experiment was negative and the lamb remained normal till sent off fat.

Ewe 82 gave birth on *3.9.27* to twin lambs. Each was inoculated *into* the tip of the navel string with a ½ c.c. emulsion of arthritis strain G6. One showed slight lameness affecting left hind on *5.9.27*. Next day both lambs were sound. On *13.9.27* both lambs were markedly stiff in their movements and, although getting plenty of milk, were not thriving. This continued, the lambs moving painfully about with dam, feeding quite well but remaining stunted.

Two months later one lamb (B) showed some lameness. She moved very stiffly on all legs, except the left fore, and with evident pain. The sister lamb (A) was obviously affected in all four limbs.

Lamb A was killed on *19.12.27* and *post-mortem* notes of the case are as follows :—

Intense panarthritis, with fluid of brownish colour containing much thick slightly greenish pus, affecting both knees, elbows, hocks and stifles. The lymphatic glands of the carcass were enlarged, especially the prescapular, popliteal and iliacs.

Cultures of the joints yielded a chromogenic (yellow) non-serum-liquefying diphtheroid from each joint, the arthritis organism used as inoculum being found in the left knee only.

Lamb B was killed on *28.12.27*. The only joints found affected were right knee, both hocks, and stifles. In this case the arthritis organism was recovered from the right knee, left hock and left stifle, but was again found in conjunction with a yellow diphtheroid, which was present also in the right hock and stifle.

The Path of Infection in Naturally-occurring Cases.

This can be surmised with some confidence to be a wound infection, the organism gaining entrance in this way to the circulation and subsequently attacking the joints for which it has a predilection. While it has not yet been proved experimentally that infection does not enter the circulation from the alimentary tract, experience in the field is contrary to this and certainly lends support to the view that infection occurs by way of wounds. We know from our experience that invasion of the blood stream is followed by invasion of the joints, but the work done on the possibility of navel infection does not support the view that this is a common route of infection, although it is certainly possible in some cases.

Enquiries in the field regarding flocks that show a heavy percentage of arthritis cases at the freezing works generally reveal that a large number of animals had shown varying degrees of lameness about a week after " marking " (*i.e.*, docking, castrating, and ear-marking). Some merely showed slight stiffness, others were obviously lame, while others were unable to stand. A great many cases, more especially of course the mild ones, recover in a few days, while others remain lame for months or until they are sent to the works or killed as food for dogs.

In an outbreak, encountered by one of us, the lambs had been marked in a pen beside the horse stables, and as each lamb was dealt with, it was dropped over the fence into the stable yard, where it lay for a few moments in the dusty and soiled litter before wandering on through the yard and back to the pasture. When visited some eight days after the marking of 200 lambs, about 20 per cent. were affected in various degrees. The " marking " wounds had healed cleanly. No treatment was undertaken and in three weeks all except about 5 per cent. were again sound.

The following year the same farmer " marked " his lambs in a new yard and placed them straight from this into a clean grass paddock. The result was that not a single case of lameness appeared amongst them.

That cases occur apart from " marking " is shown by the fact that occasionally the condition is met with in animals that have been overlooked at marking time. Possibly these are cases of navel infection. Moreover, the occurrence of lameness amongst lambs prior to marking is occasionally reported. No material has been obtained for examination from such cases as yet, but, as we have shown, arthritis can be set up by infection of the navel with this organism and the cases referred to may be of this nature.

Experimental infection of marking wounds was tried in the 1928 season, and proof has been obtained of the organism's ability to set up an arthritis when it gains entrance to the castration and docking wounds. The experiment was as follows :—

Two ram lambs had the freshly-cut scrotal wounds sprayed with a culture of the organism, and three ewe lambs had the freshly-made docking wounds similarly treated. One ram lamb and three ewe lambs " marked "

at the same time acted as controls. Lameness was noted in each of the three males and in two out of the six females by the fifth day. The females showing lameness were two of the three whose docking wounds were sprayed. The occurrence of arthritis in the control male is of interest.

These nine lambs were operated upon in a small enclosure and the spray was made with an ordinary atomiser. As none of the lambs from the rest of the flock, which were " marked " at the same time, but in another yard, showed any such symptoms it seems fair to regard them as controls and to assume that the control male lamb which evinced arthritis was accidentally infected as a result of the spraying of the others. All marking wounds, sprayed and otherwise, healed quickly and normally without treatment.

One ewe lamb showing obvious lameness at the expiration of three weeks was killed, and autopsy showed acute arthritis of the limb joints. The specific organism was obtained in pure culture from one lamb, but the other two gave mixed growths.

The other four affected lambs recovered from their lameness, but did not thrive well, remaining culls till late in the season. On slaughter, an enlarged joint was discovered in one lamb, but the organism could not be obtained from it culturally.

The results of the experiment are not as clear-cut as might be wished, but they show that infection of the marking wounds with this organism can result in arthritis. The prolonged unthriftiness of the infected limbs after all traces of lameness had disappeared rather suggests the continued existence of the organism in the body and its production of a low-grade toxin after the symptoms had subsided.

Attempts are now being made to obtain " beaded " and " bottle-brush " types in pure culture, and true to type in subculture, so that any difference in virulence comparable to the apparently great difference in antigenic value can be studied.

Preventive Measures.

At present it would appear that clean marking yards and clean paddocks for the lambs till the wounds are scabbed over, combined with the use of the usual antiseptic measures during the actual operation, are the means by which the losses can best be eliminated. Even in the event of prophylactic vaccination being successful, it would not be practicable from an economic point of view in New Zealand.

The lightness of the bones noted above in connection with the changes met with in affected joints may have significance, inasmuch as a deficiency, insufficient to cause disease by itself, may be quite a sufficient predisposing factor. It is not, however, regarded as more than a possibility and a point to be considered when more field data have been collected.

That this type of arthritis affecting lambs is not by any means confined to New Zealand is suspected. Seddon (*Australian Veterinary Journal,* September, 1927) found a similar organism causing a similar condition in Australia, and Cornell and Glover (*Veterinary Record,* 26.9.25) describe an outbreak amongst lambs from which they isolated *B. erysipelatis suis* as the causative organism.

The organism we have described agrees, as far as we have been able to determine, with *B. erysipelatis suis,* and may well be identical with it. This could best be determined serologically, but up to the present we have had no swine erysipelas serum available. Should it prove that the two organisms are identical, it will be of very great interest in view of the fact that swine erysipelas itself does not exist, and to our knowledge never has existed, in New Zealand. The case would thus be similar to that of caseous lymphadenitis in sheep, which is of very common occurrence in New Zealand, and of ulcerative lymphangitis in horses, which does not exist in this country, both of which conditions are said to be due to the same organism.

As a name has not, to our knowledge, been given to this organism we would suggest that it might be called " *Corynebacterium osteoarthritidis ovis.*"

Summary.

An arthritic condition affecting the limb joints of New Zealand lambs is discussed.

The cause is shown to be infection of the joints by an organism of the diphtheroid group, which is described.

This organism on inoculation into the circulation of sheep appears to have a predilection for the joints.

Reasons are given for believing that infection occurs under natural circumstances through docking and castration wounds.

Prevention by the use of antiseptic methods at the time of operation and the provision of clean pastures during the subsequent days, while the wounds heal, is advocated.

The organism is very similar to *B. erysipelatis suis* and may perhaps be identical with it, though swine erysipelas is entirely unknown amongst the pigs of New Zealand.

A name suggested as descriptive of the organism is *Corynebacterium osteoarthritidis ovis.*

Further work is in progress and will be reported on when completed.

Cattle Imports.

Sir J. R. Jackson, M.R.C.V.S., the chief veterinary officer of the Ministry of Agriculture, is the British member of the League of Nations Sub-Committee on Veterinary Police Measures, which holds its fourth meeting in Geneva on October 20th. This Committee is an offshoot of the main Economic Committee of the League, and was charged by the 10th Assembly in 1929 with the duty of framing " definite proposals to facilitate the report of cattle and animal products." So far, its work has largely concerned the accumulation of accurate data. The methods of the various countries for veterinary control vary. The Committee's action is intended to ensure a maximum efficacy of control while reducing to a minimum the obstacles to international trade, and at the same time guaranteeing that the measures prescribed shall not be used to further economic protectionism. A further subject that has been considered is the possibility of classifying various animal diseases according to their gravity and the risk of infection. If by standardisation it is possible to ensure that States will furnish ample and reliable sanitary information, it will be possible to simplify the measures taken to guard against the dangers of contagion against which every country wishes to protect its cattle.

At the last meeting, the question of the overseas transport of frozen meat received the attention of the Committee, who were assisted in their investigations by Colonel R. A. Reid, of New Zealand, and Sr. Dionisio Mendy, of Uruguay. Examination showed that the present situation was satisfactory, though in certain questions concerning trade in prepared meats (such as certain pork products) there was some difference of opinion.

Clinical and Case Reports.

Calcium Gluconate and Milk Fever.

By George N. Gould, junr., M.R.C.V.S., Southampton.

In view of the recent reports of unsatisfactory results and unfortunate sequelæ of calcium gluconate infections in the treatment of milk fever, I think my own experience in its use may prove of interest.

I have treated twenty-one cases of milk fever by this method and am eminently satisfied with the results.

Every case has made a complete recovery, the animal being on its feet and normal in every way within eight hours of injection in all cases except five.

Of these five, four had a recurrence within 18 hours, necessitating a second injection—I have made a few notes of these below—and the fifth case is described in full later. Every case recovered.

In one case only have I experienced necrosis of the skin and subcutaneous tissue at the seat of injection. Following the sloughing of the affected part, healing rapidly followed. I venture to suggest below the cause of the trouble and to give a recommendation for its prevention.

It would appear to be too much to ask of any treatment by injection that the medicament injected should automatically sterilise a Higginson's or any other syringe, and undoubtedly cases of severe abscess formation at the seat of injection or gravitation abscess subsequent to injection are the result of faulty technique and non-compliance with the accepted principles of antisepsis and asepsis.

In the case of necrosis of skin and subcutaneous tissue I experienced, the condition appeared to be quite sterile and to be due to non-absorption of part or whole of the fluid injected, with subsequent necrosis due to the pressure of the fluid excluding the blood supply to that part.

My technique has been as follows:—

I have used a sterilised 50 c.c. Record syringe with needle of stout bore. Sterilisation is accomplished by boiling for ten minutes before use, drying and packing in sterile cotton wool ready for use.

The calcium gluconate is placed in a clean basin which will hold the required quantity of water, previously thoroughly cleansed and rinsed with boiling water. Boiling water is added in the proportion of one pint to two ounces of calcium gluconate, and the contents stirred to dissolve.

The basin is then stood in a bowl of cold water and stirred repeatedly to aid cooling and a thermometer used to determine the temperature of the fluid.

I start injection at a temperature of 105° F., leaving the needle in position in the neck and refilling the syringe without it.

I have found no necessity to filter, but have made a practice of not utilising the dregs of the fluid prepared.

The skin is cleansed with either lysol and water or with methylated iodine at the seat of injection.

In my earlier use of the treatment I injected in three places—one in front of the shoulder and two higher up the neck. It was in one of these cases that I experienced necrosis and the part affected was that immediately below the seat of injection in front of the shoulder.

I noticed that in the injections higher up the neck absorption was rapid and the injection more easily accomplished, but in front of the shoulder absorption was slow, and I came to the conclusion that in the front of the shoulder and the lower part of the neck the injection was made into the fascia, which is plentiful in that part, with subsequent delay in absorption or non-absorption due to poorer blood supply and restriction of distribution of the fluid due to its being contained in a pocket of connective tissue.

As a result of these observations, I have used one site only for injection—well up the neck, where there is a minimum of subcutaneous fascia, facilitating distribution of the fluid by digital pressure, and bathing subsequently to assist absorption. Following this, the part is rubbed dry.

Absorption usually appears to be complete within two hours by this method and the effects of injection are very soon noticed. In cases of extreme coma, there is a gradual return of reflexes, the corneal reflex (previously not observable) returning within a few minutes, swallowing movements of the œsophagus being the next observable improvement, with gradual improvement in respiration, followed by lifting of the head and gradual return of the functions until the cow is able to rise to her feet.

I started the use of this treatment by giving two ounces in one pint of water, and found that sufficient for the first three, recovery ensuing in every case within eight hours. I then had a case in which the cow recovered in four hours, remained so for 15 hours, and then had a recurrence necessitating a second injection. An experience of three such cases—the initial dose in one being two ounces and in the other two four ounces—led me to the conclusion that in those cases in which a cow recovers in under six hours it is advisable to give a second injection within the next twelve hours to avoid a recurrence.

I have since tested this and found it to be correct in another case of recovery in five hours and subsequent relapse twelve hours later.

At one farm where I attended a cow for milk fever, the owner informed me that another cow had just calved (a Jersey) which had milk fever at two previous calvings, and on each occasion considerable difficulty had been experienced in saving it by the inflation treatment. He asked if the calcium injection would act as a preventive. I hazarded a positive opinion and gave an injection of four ounces in one quart of boiled water at 100° F. Twenty-four hours later the cow went down with milk fever.

I gave an injection of two ounces calcium gluconate and recovery was complete in eight hours.

Another case concerned another Jersey cow—third calver—which had milked 975 gallons the previous year. She went down with milk fever within twelve hours of calving and was comatose when I saw her at 6 a.m.

I gave four ounces of calcium gluconate—the cow was on her feet by 10.30 a.m. I saw her at 2.30 when she appeared quite normal.

The cowman saw her at 9 p.m., when she appeared to him to be all right, but at 10 p.m. she was down again. I saw her at 11.15, when she was completely comatose; breathing stertorous, froth exuding from the

nostrils as a result of forced expirations; corneal reflex gone, temperature 99°.

I gave an injection of four ounces calcium gluconate. Within ten minutes the corneal reflex had returned, followed at a short interval by improvement in respirations and swallowing movements of the œsophagus. Within twenty minutes the cow had lifted her head and swung it around to the side, showing at the same time indications of recovered consciousness.

The cow rose to her feet at 4.30 a.m. She appeared quite normal all the following day until 7.30 p.m., when she was again found down and rapidly lost consciousness.

I saw her at 8.45 p.m., and gave six ounces of calcium in three pints boiled water at 100° F.

The cow was on her feet in two hours and made an uneventful recovery.

The summary of my conclusions is as follows:—

Calcium gluconate treatment of milk fever is a distinct advance on the inflation treatment in ease of administration, rapidity of action and avoidance of possible mastitis following inflation, especially in cases of cows with a doubtful quarter.

Provided antiseptic and aseptic precautions are taken and the injection is given in a position where there is a minimum of fascia—the injection being truly subcutaneous —there is no fear of necrosis of skin and subcutaneous tissues, or of abscess formation at the seat of injection, or gravitation abscess.

In cases which recover after an initial dose of calcium gluconate in less than six hours a second dose is advisable to avoid relapse. I have made this a routine measure in my own practice.

Knuckling of the Fetlock in Foals.*

By E. N. Larkin, B.V.Sc., Resident Veterinarian, Widden Thoroughbred Stud, New South Wales.

In thoroughbred stock, knuckling at the fetlock in foals is not uncommon. The degree of knuckling varies from the condition in which the third metacarpal bone and the first phalanx are in the same straight line, the angle of the fetlock being effaced, to that in which the foal walks or supports its weight on the anterior aspect of the fetlock and the dorsal surface of the pastern. In the less exaggerated conditions, the foal may support itself quite well when standing still, but nevertheless goes down on the front of the fetlock and pastern when movement is attempted. The condition when found is usually present at birth. It may affect either one or both of the fore or hind fetlocks. In my experience the hind fetlocks are the more commonly affected.

Cause.

Apparently the cause has not been definitely or satisfactorily explained. According to Dollar, knuckling in foals has been attributed to "infection derived from the mare during gestation or contracted soon after birth, to myositis of the flexors of the foot, and when associated with bent knees to myositis of the flexors of the metacarpus."

Fröhner says: "Congenital cases are often due to weakness of the extensors, and some breeders from observation of the produce of certain stallions regard the condition as hereditary."

Lafosse thinks: "It arises from disproportion between stallion and mare, the bony framework being excessively developed when the stallion is too large."

(From my own experience I can enumerate numerous cases occurring where there was absolutely no disproportion between stallion and mare.)

Dollar says: "There are two possibilities—either the tendons are too short or the metacarpus is too long. The first may be referred to either defective development or subsequent shortening of the tendons. Whether, in such case, the development of the flexor tendons is interfered with by the position of the fœtus *in utero*, or whether contraction occurs, or whether the long axis of the metacarpus is excessively developed so that the tendons are relatively too short, or whether again the point of origin of the muscles is abnormal, is, for the time at least, undecided."

Abnormal positions *in utero* may have a bearing on the condition, or it may be caused in more than one way, or indeed there may be more than one contributing factor. However, the rapidity with which the condition yields to treatment, if that treatment is immediate and correct, tends, I think, towards the idea of contraction of the tendons. I have noticed the progeny of certain stallions to be prone to the condition, and hence I lean towards the possibility of a hereditary nature.

Symptoms.

Abnormal volar flexion of the fetlock joint is obvious. The muscles and/or the tendons are distinctly taut, though otherwise normal. Ability to carry weight depends on the degree to which the condition is developed. Where the condition is pronounced we have the foals standing on the point of the fetlock joint. When present in a milder form the foal may move about freely, but knuckles over on the joint at each stride. Where only one fetlock is affected movement is naturally easier.

Course and Prognosis.

Where the condition is apparent but not very decided, it usually disappears even if left untreated. When of a more pronounced nature it disappears under proper treatment in five or six to fourteen days. Speaking generally, the prognosis is good, and provided the treatment is early, apparent cripples may recover in fourteen days. One subject is now racing prominently as a two-year-old, and was described by a sporting scribe of note, when discussing yearlings prior to the last yearling sales at Randwick, as having "a splendid set of legs of great bone."

Treatment.

Each case calls for individual consideration. The general principle, however, is that of support and pressure. The trouble with splints is that the skin is so tender, and no matter however carefully one packs and adjusts the part, the splints are inclined to move and the skin sloughs over joints.

Throw the foal and have him secured satisfactorily.

* Reprinted from *The Australian Veterinary Journal*, June, 1930. Vol. vi, No. 2.

Wash the limb or limbs in a mild disinfectant, cleanse thoroughly and dry well on a clean towel. Bandage the whole of the leg to be covered with splints, and the foot, with adhesive tape, but do not draw the tape too tightly around the leg, at the same time drawing the toe as far forward as possible. The adhesive tape is used in order to try and protect the skin against chafing. Special precautions against chafing and excessive pressure are to be taken immediately over the front of the fetlock. If the foal is not observed early, the skin over the coronet and fetlock will be worn through, and this lessens the hope of success. Now place a layer of cotton wool around the foot and limb and bandage moderately firmly with a crêpe bandage. Then another layer of cotton wool and bandage again with a calico bandage, and this time draw the foot into the best possible position. Include the foot in this bandage and bandage as tightly as is consistent with safety. Now apply the splint which has been made to fit the case. It is one continuous length of galvanized hoop-iron, 1½-in. by 24 gauge, which comes down the front of the shin, under the foot and then up the back of the leg. Thus the material employed is sufficiently flexible to be of considerable advantage and yet, being double, is strong enough to give the necessary support. The method of making the splint is described later.

Have two lengths of bandage looped around the splint and tied tightly around the leg to stop the splint slipping around.

See that the knots are over the outside of the splints so as to reduce the likelihood of excessive pressure on any part. Do not let the bandage curl, but keep it spread out so as to lessen the risk of cutting the leg. Now bandage as required over the splint. Take the bandage right to the level of the pointed toe, but there is no need to go under the foot as the iron splint is a bearing surface on the ground. If the splint does not slip, the leg does not swell or the temperature rise, do not touch for three days. If the foot cannot be drawn very far forward at the first attempt, then the splint may be removed earlier and the foot drawn forward into better position and the splint restrapped. After two or three days throw the foal again and remove splint and bandages. If there are no sores, replace if necessary (if there are sores, treat them). As soon as one or both feet are sufficiently recovered to discard the splint, but not quite sound enough to go entirely unsupported, then use a plaster bandage. If sores are present they must be attended to, care being shown in resplinting, bandaging, etc. It might be advisable to leave one leg in splint till next day so as to ensure adequate support for the free leg. If this is done, remove the splint next day or the day after, and replace with plaster or merely a bandage according to the condition of the leg. Each time when changing the bandages or splint, draw the toe as far forward as possible. Also reshape the splint. When removing either the splint, plaster, or finally the bandages, I think it best to do only one leg a day, as this leaves one supported leg to bear a good share of weight. When only bandages are left on do not take them off too soon, but leave them on some days, changing as often as necessary. If this precaution is not taken the joints will swell considerably. During the progress of the condition the general condition of the foal must be observed daily. Care must be taken to see that the foal does not become constipated. It is advisable to keep the mare and foal in a box or small yard if shady enough; hence exercise is restricted and constipation is more or less to be expected. Take the temperature daily to ensure that there is no rise in temperature.

Take a piece of pliable tin or some similar substance, sufficiently long to extend down the front of the metacarpus and pastern, under the hoof and up the back of the leg to the same height as in front. Work it to correspond to the shape the foot and leg will take when the foot is drawn as far forward as possible. Now take a piece of galvanised hoop-iron, 1½-in. by 24 gauge, or some equally suitable material, and work into shape, modelling it on the pattern already made to fit the leg. Carry the splint well up the front and back of the leg, to within about three inches of the knee or hock. Make the extension of the toe about 1½–2 inches long. Groove the iron as much as possible to fit the rounded front and back of the leg. Bend each of the tops of the splint out so that they will not cut the leg. File each of these extremities quite smooth and round the corners. Now cut a piece of basil or felt the length of the splint and about two inches wider. Cut slits where necessary in the centre of the padding so as to allow one inch to lie on either side of the splint and slip this on to the inside of the splint to act as padding. Use a continuous strip down the front, under the foot and up the back of the splint. Now loop the pieces of bandage loosely around the splint to tighten and tie when placed on the leg.

[The article is illustrated by a series of photographs taken of one particular case and showing various stages from the morning of birth to the date of discharge eleven days later.—Ed., *V.R.*]

Tragedy of Taxation Burden.

" The decision of Lord Derby to curtail his racing stud in this country is a further reminder of the growing hardships involved in our ever-increasing burdens through extreme taxation," says the *North British Agriculturist*. A man who never bred racing horses for the mere purpose of making money by betting—he is understood to have never betted in his life—Lord Derby was one of those whose sole interest in the breeding of blood horses lay in the general good of the breed, which, after all, commands the highest values of any, and is thus a valuable asset in the live stock economy of this country. It is thus an unpleasant and disquieting feature of horse breeding interest in this country that men who are in a position, under ordinary circumstances, to support the industry, are compelled, by taxation burdens, to slow down their activities. The pity of it, also, is that in other departments of pedigree stock breeding similar circumstances are gradually lessening the opportunities of those who would wish to carry on.

The above observations gain in point from the following information given in a recent issue of *The Times*.

" It is stated that Baroness Wentworth is to sell her unique stud of pure-bred Arab horses at Crabbet Park, Sussex, reputed to be worth nearly £250,000. ' The overwhelming and increasing burden of heavy taxation has decided me to reduce my stock.' Lady Wentworth said, ' and now the world's most famous stud is for sale by private treaty. The sale includes my world champion seven-year-old stallion, and a magnificent collection of prize stallions and mares of the highest merit from the best race-winning blood. My favourite horses I shall keep for myself."

Abstracts.

[**Experiments on the Diagnosis of Pregnancy in the Mare.** Schoop, G., *D.T.W.*, 1930, 38, 23, 357-9.]

Two sexual homones are involved:—

(1) *Ovarian hormone*: This is present in the ovary and also in the uterus, and is responsible for the production of sexual desire. Its artificial injection into animals, be they sexually mature, virginal, or even castrated females, produces this desire. A reddening and swelling of the genital organs accompanies this, together with the appearance of cornified stratified epithelial cells in the vaginal smear preparations. This latter phenomenon accompanies natural "heat."

(2) *Anterior Pituitary Hormone.*—The injection of this hormone produces ripening of the ovarian follicles with ovulation, and further, the production of petechiæ in the follicles. Further, in the male animal, sexual desire is produced.

Both hormones are excreted in the urine of pregnant females. That of the pituitary appears very early and further disappears early, and that of the ovary appears at a much later date.

Ascheim and Zondek applied these observations (as applies to the pituitary hormone) to the early diagnosis of pregnancy in the human female. The mouse (about three weeks old) is employed as test animal: urine is injected and a positive result is recorded when such results as follicular petechiæ, production of corpora lutea, are produced. The changes may be seen with the naked eye, but it is advisable to make "crush" preparations between slides and examine with a low power microscope or, in doubtful cases, to cut sections.

Attempts to demonstrate this anterior pituitary hormone in the urine of animals other than the ape have failed, but Küst and Grawert have lately stated that they have been able to demonstrate ovarian hormone (and thus pregnancy) in the urine of the horse, ox and dog. Details of their method were not given.

The author investigated the question (mice being injected with urine) with the following results:—The urines of five pregnant mares were examined (pregnancy respectively three months, six months and in three cases unknown): as control, the urine of a non-pregnant mare was employed. In no instance was a positive result obtained. Unfortunately, four of the urines produced death within 12 hours and the remaining two samples had a very injurious effect. These untoward happenings to a great extent vitiated the results.

J. H. M.

[**Trichonema skrjabini n.sp. A New Nematode Species in the Horse.** Erschow, W. S., *D.T.W.*, 1930, 38, 18, 277-79.]

The worm had origin in the large bowel (cæcum and colon) of a horse in Siberia. The author places it in family Strongylidæ Baird 1853; genus, Trichonema Cobbold 1874, and subgenus, Cylicostephanus Ihle 1922. (The features of the genus and subgenus are recorded). The new species was named after Professor K. I. Skrjabin, the author's teacher. Six specimens (five male and one female) were obtained for examination.

Male.—Straw-yellow coloured, spindle shaped. Body thickest in middle portion. The transverse "ringing" of the cuticle, poorly marked, diminishes from the head and backwards until it quite disappears. Length 13·0-13·4 m.m. by 0·531-0·617 m.m. breadth (at broadest part). The head end is ringed by a crest or ridge 0·003-0·004 m.m. by 0·174-0·192 m.m. separated from the mouth capsule by a sharply marked furrow.

Two lateral head papillæ are faintly marked and arise nearly at the level of the crest. Four submedian papillæ are more sharply marked. The mouth capsule is cylindrical.

The surface layer of the mouth capsule is double, thick and reaches its maximal breadth at its lower third. The inner surface layer is of equal thickness throughout and of a clearer yellow colour than the outer. The three cornered corona radiata externa consists of 28 elements, of a tapering nature. The corona radiata interna consists of 80 very fine elements. The base of the mouth capsule has a tiny rim provided with about 50 very small outgrowths. At the mouth of the œsophagus there is a simple funnel-like dilatation. The œsophagus is 0·618-0·661 by 0·209-0·221 m.m. The excretory opening is 0·595 m.m. from the head end.

Bursa.—Length 1·127-1·268 m.m. Its borders are beautifully scalloped. The median lobes are long and tapering. The lateral lobes entirely cover the genital cone. The dorsal ribs, 0·561-0·612 m.m. long, divide dichotomously into two branches, from which again, in a caudo-lateral direction, three side roots arise. The costa externo-dorsalis bends at nearly a right angle, away from the dorsal rib. The costa lateralis is well developed; the postero-lateralis and medio-lateralis run parallel to one another; the antero-lateralis is slightly curved and diverted against the costæ ventralis. The costæ ventralis are formed of two ribs leaning, from each side, one against the other. There are two papillæ praebursalis—very thin—and they are of the nature of costæ accessoria. Spicula have the form of a chitinous cord; the end is hook-like. The gubernaculum is very large, and in its middle portion globular outgrowths are to be noticed. At the proximal end of the gubernaculum a curve is present, of a scabbard-like appearance.

The genital cone is well developed, with a massive dermal ridge and each side of the cloacal opening is provided with a papilla-like structure.

Female.—Only one female (with a damaged tail end) was available. Spindle-shaped and straw coloured. Length 14·2 mm., breadth at broadest point 0·664 mm. Mouth capsule as in male, œsophagus somewhat longer. No eggs demonstable in specimen examined.

The article concludes with a differential diagnosis from five other Trichonema.

J. H. M.

[**The Characteristics of the Nematode of Cattle—Capillaria (Capillaria) bovis (Schnyder, 1906).** Petrow, A. M., and Orlow., I. W., *D.T.W.*, 1930, 38, 18, 174-7.]

The origin of the worms was the small intestine of two cows, from the Tambov and Nishny-Nowgorod districts of Russia.

The parasite is long and thread-like, mouth opening terminal, leading into a long œsophagus.

Male.—11·9 mm. long and 0·062 mm. at its broadest part. The cloacal opening is subterminal. The tail end is provided with two large lateral flap-like lobes, easily torn-off (on pressing the worm) and with a middle lobe, attached to the end of the parasite. This middle lobe or flap is small and is supported by two rib-like projections. The rib-like projections, bend 0·0192 mm. in front of the cloaca and produce a right angle with the lateral border of the middle lobe. Almost just at this point they divide into two very small, median kidney-shaped branches.

Female.—Reaches 18·725-21·83 mm. in length by 0·0788-0·1005 mm. at its broadest part. The anus opens subterminally. The vulva is 6·9—8·3 mm. from the head end and 0·179-0·23 mm. from the posterior border of the œsophagus. The vulval opening is nearly oval, and is surrounded by two smooth somewhat projecting lips. Behind the vetral lip originates, nearly at its base, the body of a cleft, papilla-like cuticular protuberance. In addition, on the worm body, in the vulval region are found two hardly discernible cuticular outgrowths; one is dorsal to the dorsal lip of the vulva, the other—ventral—is behind the cleft papilla-like protuberance. Finally, the vulva is provided with two clear cuticular swellings, one lying lateral and from "behind forwards" to the vulva and of a more or less oval form (0·05 by 0·035 mm.). The other is directed from behind backwards and more ventralwards than the first, immediately over the vulva and is provided with a papillary, cleft protuberance.

The eggs, of a characteristic lemon shape, are provided with projecting knob-like poles, and with a moderately thick (0·003 m.m.) shell. Their surface layer shows a kind of faint longitudinal strippling. The length of the egg is 0·05-0·052 mm. by 0·0285-0·03 in breadth.

The authors compare *C. (capillaria) bovis* (Schnyder), 1906) with *C. longipes* Ransom, 1911, and are of opinion that they are identical. They are also of the opinion that *C. brevipes* Ransom, 1911 has very distinguishing points from *C. bovis* (Schnyder, 1906), but not having studied the former, they are unwilling to offer a final conclusion.

The hosts of *C. (capillaria) bovis* (Schnyder, 1906), up to the present have been the ox, sheep and antelope (Switzerland, North America, Scotland, Germany and Russia).

J. H. M.

[Some Researches on Chronic Metritis in the Dog and Cat. Möller Sörensen (*Tierärztl. Rdsch.*, 1929, Nos. 28 and 29).]

The author examined 46 uteri so affected from cats and dogs. Twenty-six cases were purulent endometritis with ulceration, and histological examination of such showed that the alterations extend much more deeply than the naked-eye appearance leads one to suppose. Bacteriologically, 30 out of 44 cases were associated with *B. coli* infection, and these organisms could be cultivated either purely or in company with others.

The mode of infection is usually *per vaginam*, though owing to the frequent presence of coliform bacteria, the author supposes that it may also originate from the intestinal canal.

J. T. E.

N.V.M.A. Divisional Reports.

Lancashire Division.*

Summer Meeting at Chester.

Operations and Demonstrations.

The Summer Meeting of this Division was held at the Veterinary Establishment of Mr. J. Storrar, M.R.C.V.S., Newgate Street, Chester, on Friday, July 18th, 1930.

The President, E. H. Curbishley, Esq., M.R.C.V.S., occupied the chair, and others present were Messrs. R. Hughes, H. T. Matthews, M. T. Giblin, C. Hargreaves, J. H. White, W. L. Cockburn, G. H. Locke, H. G. Hewetson, J. Hughes, A. H. Leyland, J. Birtwistle, W. F. Morton, A. New, R. Finch, F. H. Leech, H. H. Aldred, J. Holroyd, H. Holroyd, K. D. Downham, H. Sumner, junr., A. W. N. Pillers, G. Mayall, C. T. Trevers, H. S. Caldwell, W. Kendrick, J. B. Chadwick, R. H. Oddy, S. H. Gaiger, E. Greenway, W. Walker, W. Fowle, J. Cochrane-Dyet, J. Storrar, F. G. Edwards, G. C. Marginson, T. McGhee, and J. Spruell (Hon. Secretary).

Visitors.—Messrs. H. T. Hughes, J. Cane, A. L. Mullen, H. Jones, R. Trindle, R. W. Glaister, R. Hopps, J. S. Garside, W. T. Rowlands, R. F. Montgomerie, O. Stinson, N. B. Sidhorn, C. V. Jones, G. B. Edwards, L. W. W. Lloyd, W. W. Lang, H. Bebbington, J. H. Hayle, G. R. Roberts, Trevor Roberts, and J. H. Wynne.

Apologies for unavoidable absence were received from:—Professor F. T. G. Hobday, Col. J. W. Brittlebank, Majors J. Abson and W. G. Burndred, Messrs. W. Tweed, P. Manuel, R. C. Locke, H. D. Heggarty and D. E. Orr.

The minutes of the last general meeting were taken as read and approved.

Mr. Caldwell proposed, Mr. Locke seconded, and it was carried, that a letter of sympathy be sent to Mr. J. T. Allen on his recent sad bereavement.

Nomination.—The President nominated Mr. H. V. Hughes, B.V.Sc., M.R.C.V.S., as a member of the Division.

President's Remarks.

The President, in his opening remarks, said: The Council and members of this Division would wish my first words in opening this meeting to convey a sincere and hearty welcome to the many visitors who have honoured us with their presence at our Summer Meeting, and this applies especially to the members of our neighbouring society, *viz.*, the North Wales, and to some of our own members whose faces we see all too seldom at our general meetings in Manchester and Liverpool.

The veterinary profession is a small and scattered body, and the opportunities for social and professional amenities are not always easy to arrange, particularly amongst those who conduct single-handed practices in wide and straggling country districts. The present, however, is an opportunity of which we wish to make the utmost use, and it

* Received on September 7th.

is with real pleasure that, in the name of my Society, I welcome our visitors to-day. (Applause.)

Reverting to our programme, I feel free to say that I do not remember ever having attended a meeting where so much has been undertaken, in the course of one short afternoon, as we hope to get through to-day. I am constrained to say, also, that except for stating the lines upon which I should like this programme to develop, I have nothing to do with the arrangements. The whole of the work has been undertaken by our very good friend Mr. Noel Pillers, and I wish to express in the fullest terms of appreciation my personal indebtedness to him. I almost wish that he were not present, that I might voice an eulogy worthy of such disinterested devotion as he is ever ready to extend towards anything which has for its object the advancement of veterinary science. (Hear, hear.)

The object of this syllabus is, of course, to demonstrate a number of the minor operations which are all well within the power and compass of any general practitioner to perform, because, as our friend Mr. Holroyd very tersely puts it: " It is all a matter of daring to do the first; after that, one looks for more and enjoys them, gaining dexterity and confidence with the experience."

Now that one's neighbours are more willing perhaps than formerly to give a hand with anæsthetics and so on, it is to be hoped that surgery will come to be much more freely practised than in time past, and so add to the reputation and standing of the individual veterinarian and the profession as a whole.

Henley paid what I think must be one of the finest compliments the medical profession ever received, when he described one of the great human surgeons as possessing " Faultless patience and unerring will, beautiful gentleness and splendid skill." Since surgery is surgery, whether of the higher or the lower creation, it cannot be too much to hope that we, or rather, those of us who have the gift and opportunity, may become worthy of such a glorious tribute and appreciation. (Applause.)

Operations and Demonstrations.

Before proceeding with his demonstration of fowl pox vaccination, Mr. A. L. Mullen gave a brief resumé of the nature of the disease and explained the mode of infection, prevention, treatment, and control of an outbreak. He exhibited specimens showing the clinical lesions and explained the economic importance of this disease to the poultry farmer. He showed the method of preparing fowls for the operation and vaccinated a fowl by the Feather Follicle Method.

Mr. H. Sumner, junr., gave a lucid explanation of the operation of caponising, and skilfully operated on twelve cockerels. He also demonstrated the use of the stomach tube in the horse and intravenous medication in the same animal.

Mr. O. Stinson stepped into the breech caused by the unavoidable absence of one of the demonstrators and operated on a horse with fistulous withers and also removed the outside claw of the left hind foot of a cow.

Cryptorchid Operations.

Mr. J. Holroyd operated on two cryptorchid colts. The animals, two-year-old Shires, had been prepared for operation by fasting for 24 hours. The hind legs and feet having been washed down, the colts were cast with sidelines so that the hind legs were spread open (a modified McDonald method). Chloroform was skilfully administered by Mr. F. G. Edwards.

The first animal had had a normally situated testicle (near side) removed in the Spring of 1929. An incision having been made over the external inguinal ring of the off side, the tissues to the opening of the inguinal canal were broken down with the fingers, the canal was entered with the left hand and ultimately the abdominal cavity was entered through the internal inguinal ring, when the testicle was easily found. The testicle was withdrawn and removed with the écraseur. The canal was lightly packed with ten per cent. iodoform gauze, the skin wound sutured and iodine applied.

The second colt had had a normally situated testicle (off-side) removed in the Spring of this year. When the animal was cast the missing testicle could be felt on manipulation at the lower extremity of the inguinal canal; this was removed by the écraseur, no packing or suturing being necessary in the case.

Mr. Holroyd's demonstration, on the carcass of a calf, of the usefulness of the Danish embryotome, was watched with great interest.

" Avertin " Narcosis.

Mr. H. S. Caldwell operated on kittens under Tribrom-ethyl-alcohol (Avertin) narcosis:—

(1) *Subject.*—A tortoiseshell kitten for spaying, weight 7 lbs. Avertin, 0·9 c.c. in 33 c.c. distilled water. She had not been prepared for anæsthetisation and a small amount of fluid escaped from the anus, but in five minutes she was completely anæsthetised. The operation was not performed (on account of the other operations proceeding) until about two hours later, when the kitten was narcotised, but not sufficiently deep enough for spaying, therefore one drachm of ether was given by inhalation. The ovaries were removed through incisions in each flank, the skin only was sutured and bandages were not applied. It was reported that this kitten remained " absolutely out " until 9 a.m. next day, and did not appear to recognise food or anyone until 11 or 12 p.m. that night, when it was able to sit up, but not to walk for an hour or so later.

(2) *Subject.*—A very small Blue Persian kitten for extirpation of the eyeball.

This kitten was not prepared for operation, was given 0·3 c.c. Avertin in 10 c.c. water per rectum and in ten minutes was anæsthetised. After two hours it was narcotised but able to make feeble movements of the head and fore limbs. One drachm of ether, repeated in a few minutes, was given by inhalation, and the eyeball removed immediately after under complete anæsthesia. By next morning the kitten was free from the effect of the narcotic.

(3) *Subject.*—A black kitten, six weeks old. The animal was given 0·2 c.c. Avertin in 7 c.c. water at 8 p.m. the day before the meeting. It was anæsthetised for some hours, but by morning it had recovered so far as to be able to move about when disturbed. It was given further doses of 1 c.c. Avertin at 9 a.m. and 3 p.m.; after each dose narcosis was complete in five minutes and lasted about two hours. At 5 p.m. the kitten slept soundly, but when handled was able to struggle feebly. At 10 p.m. the kitten was quite normal.

Young kittens seem to throw off the effects of the

narcotic more rapidly than older cats, and they are quite lively after recovering from long periods of narcosis. Avertin is a useful drug to restrain intractable cats for treatment and may be given safely in small repeated doses.

Mr. K. D. Downham demonstrated the Intradermal Tuberculin Test.

[In so doing, Mr. Downham made similar observations to those reported from him on this subject in the account of the meeting of the North Wales Division, N.V.M.A., held at Corwen on July 11th, published in our issue of September 13th.—Ed.]

At the conclusion of the demonstrations and operations, Mr. Matthews proposed, Mr. Tudor Hughes seconded, and Mr. Wynne supported, that a hearty vote of thanks be accorded to the demonstrators, operators, and those who had contributed to the success of the meeting.

On July 29th, Mr. Storrar reported that all the patients operated on were making most satisfactory progress. In the second "rig" there was some swelling, but no temperature.

John Spruell, *Hon. Secretary.*

North of England Division.*

Film Demonstration at Newcastle.

A meeting of this Division was held in Armstrong College, Newcastle-on-Tyne, on September 6th, 1930, when the chair was occupied by the President, Councillor J. H. Taylor, and the attendance book was also signed by the following:—Messrs. W. J. Young, Isherwood, McDowall, T. M. Mitchell, J. D. Peele, H. S. Elphick, W. L. Stewart, Wilkinson, Nicholson, Christopher, Snaith, Doughty, J. W. Rider, Lightfoot, J. Stewart, Perkins, Hicks, Barker, and J. R. Rider, Hon. Secretary. Visitors were Professor J. McCunn and Mr. Southern, Royal Veterinary College, London.

Apologies for absence were received from Dr. Bradley, Principal Hobday, Messrs. Hill, H. Peele, Davidson, and Blackburn.

The minutes of the preceding meeting were taken as read, and confirmed.

Correspondence.—A letter conveying thanks for his election to Honorary Membership, was received from Dr. Bradley.

Election of New Members.—Messrs. W. J. Young and J. Stewart were unanimously elected to membership, on the proposal of Mr. Elphick, seconded by Mr. Wilkinson.

Film Demonstration.—Professor McCunn then gave a cinema display illustrating a number of conditions observed in practice. Included in the series were many examples of lameness in the horse and dog, pleuro-pneumonia, broken wind in the horse, chorea in the dog, the administration of Avertin anæsthesia in the cat, the roaring and cryptorchid operations in the horse, and normal parturition in the cow and goat.

In addition, Professor McCunn shewed a number of X-ray photographs relative to some of the cases shewn on the film, and samples of the modified Blenkinsop shoe, which he had found to be of value in shoeing the various types of lameness.

The demonstration was greatly appreciated and a number of questions were asked and suggestions made, to which Professor McCunn made suitable reply, and the demonstrators were accorded a cordial vote of thanks, on the motion of the President.

Any Other Business.—Mr. Christopher made reference to the uncertainty which appeared to exist as to the correct interpretation of the double intradermal tuberculin test, and suggested that it might be helpful if another demonstration of the technique could be arranged. It was agreed to refer this matter to the Council for consideration and necessary action.

Exhibit.—Mr. Young exhibited the heart of a four-months'-old pig shewing verrucose endocarditis on both right and left sides of the organ. He remarked that it was unusual to see the lesion on the right side of the heart. This pig had been ill only 24 hours, and exhibited symptoms of cyanosis and thumping. It was difficult to get a satisfactory history of these cases, and only rarely could one obtain a history of urticaria. The differential diagnosis was therefore difficult, for one must always bear in mind the possibility of swine erysipelas. The condition appeared to be quite common, a number of cases having come under his observation after being reported as suspected swine fever. Mr. Young had seen the condition in a three-weeks'-old pig, and a similar condition in the calf and the horse. It was communicable to human beings.

Mr. Snaith mentioned a similar case in a yearling colt.

A vote of thanks to the President for his conduct in the chair brought the proceedings to a close.

J. R. Rider, *Hon. Secretary.*

* Received on September 8th.

Yorkshire Division.*

Kodascopic Exhibition of Veterinary Films at York.

A meeting of this Division was held at the Station Hotel, York, on Friday, July 25th, 1930, when Professor J. McCunn, of the Royal Veterinary College, London, was present, and gave an exhibition of a number of veterinary films, a library of which is now in process of formation at the College.

The President, Mr. F. Scott, occupied the chair and the other members present were:—Messrs. A. McCarmick, H. G. Bowes, G. E. Bowman, J. C. Gaunt, W. A. Campbell, W. Halstead, E. F. McCleery, R. S. Smyth, J. McK. McKellar, W. R. McKinna, D. Hamilton, J. W. Procter, M. Robinson, H. Pollard, C. Secker Smith, E. F. Hardwick, W. T. McGregor, R. Hayes, and S. Sharp (Hon. Secretary). The visitors present were Messrs. P. Dennis Dunn, D. D. Canning, C. Roberts, W. Jackson Young, J. H. Taylor, Major A. Hodgins, D. Barker, Professor McCunn and Mr. Southern.

The minutes of the last two meetings were approved. Apologies for absence were intimated from Messrs. Rabagliati, Abson, Noel Pillers, Croudace, Dixon and Clarkson.

International Veterinary Congress.—The President was appointed as delegate from the Division to the Eleventh International Veterinary Congress.

* Received on August 29th.

Practical Training for Students.—Consideration was given to the scheme inaugurated by the Lancashire Division, in conjunction with the Liverpool Veterinary School, by which a panel of practitioners is to be formed with whom veterinary students may obtain practical training. Mr. BOWMAN proposed and Mr. GRANT seconded that the matter be allowed to lie on the table.

N.V.M.A. Council.—Mr. D. S. Rabagliati, on the proposal of Col. BOWES, seconded by Mr. CAMPBELL, was elected as a representative of the Division to the Council, N.V.M.A.

Elections to Membership.—Mr. J. McK. McKellar (proposed by Mr. W. R. KcKINNA, seconded by Mr. McGREGOR) and Mr. J. B. McKinna (proposed by Col. BOWES, seconded by Mr. McCARMICK) were elected members of the Division.

Nomination.—Mr. P. Dennis Dunn (Hull) was nominated for membership by the HON. SECRETARY.

Social Meeting.—The Balance Sheet of the Social meeting held in April was passed on the proposal of Col. BOWES, seconded by Mr. GAUNT.

Film demonstration.—Professor McCUNN then showed a very interesting collection of films, being assisted by Mr. Southern, from the Royal Veterinary College, who operated the Kodascope. The excellence of the demonstration was enhanced by the interesting manner in which Professor McCunn described and commented on the different subjects shown.

The discussion on the demonstration was participated in by Col. Bowes, Mr. G. E. Bowman, Mr. J. H. Taylor, Mr. J. C. Gaunt, Major A. Hodgins, R.A.V.C., Mr. H. Pollard, Mr. W. Jackson Young, Mr. F. C. Scott and Mr. Charles Roberts. Professor McCunn replied to the discussion in an interesting speech.

A vote of thanks to Professor McCunn and Mr. Southern for the trouble taken in coming from London to give the meeting such an enjoyable entertainment, was proposed by Col. BOWES, seconded by Mr. SCOTT and carried with acclamation.

S. SHARP, *Hon. Secretary*

Dumfries and Galloway Division.*

Summer Meeting at Kirkcudbright.

The Summer Meeting of the above Division was held in the Royal Hotel, Kirkcudbright, on Thursday, June 26th, with the President, Captain A. Young, in the chair.

The following members were present:—Messrs. A. Young, R. Simpson, G. D. W. Davidson, A. Edgar, A. J. Kennedy, N. H. Nicholson, W. L. Mackenzie, A. J. Milligan, G. A. Sangster, J. Waddell and F. A. Davidson (Hon. Secretary).

Minutes were taken as read, as published in the *Veterinary Record.*

Apologies for absence were received from:—Messrs. R. Craig Robinson, P. McKinley, F. N. Croudace, J. Wilson, A. B. Kerr, O. Stinson and J. G. Bell. Visitor: Mr. Esmond Brown.

The following ladies also attended the lunch and motor trip which followed:—Mrs. Young, Mrs. Cheadle, Mrs. Edgar, Mrs. McAlister, Miss McNae, Mrs. Fyffe and Mrs. Davidson.

Correspondence.

(1) From the Secretary, International Veterinary Congress.

It was decided that, owing to the widespread distribution of the members of the Division, it would be impossible to form parties to attend the Congress.

(2) From the Secretary, Scottish Branch.

(*a*) Branch Fund and expenses of representatives to the Council of the R.C.V.S.

It was decided that, as a Member was adopted by the Division as a Candidate at the Council Election at the last meeting, and since then had been elected to the Council, no contribution be made to a Branch fund at present.

(*b*) Correspondence *re* the Department of Health for Scotland.

Mr. SIMPSON, seconded by Mr. YOUNG, moved that the Branch be asked to take steps to ensure that a veterinary surgeon be elected to the staff of the Department of Health for Scotland, as soon as practicable.

Notice of Motion.—In view of the decision of the meeting not to contribute to a Branch fund, the Secretary withdrew his motion to alter Rule 5 to increase the annual subscription.

Election of Representative to Executive Committee of the Scottish Branch.—On the proposal of Mr. SIMPSON, seconded by Mr. SANGSTER, it was agreed that the President, for the time being, should be the representative to this Committee.

ANY OTHER BUSINESS.

(1) Mr. McALISTER drew attention to the fact that recently certain Institutions had published detailed reports with regard to various lines of investigation carried out by members of the veterinary profession. After considerable discussion it was decided that the Secretary of the Branch should be communicated with and asked to bring the matter up at the next meeting of the Branch.

(2) Mr. EDGAR congratulated Mr. Milligan on his recent successful action against the County Council of Dumfries for payment of fees in respect of Notifications of Disease, and he moved that Mr. Milligan be asked to forward his expenses in this action to the Secretary for submission to the next meeting of the Division. This was seconded by the PRESIDENT and agreed to.

(3) A member drew attention to the fact that recently he had been considering the institution of proceedings against a client for the recovery of fees, and that he desired assistance from his colleagues in the district. It was agreed that, should he find it necessary to take the matter to Court, the Secretary would procure from Members of the Division all the necessary information, both as to whether the scale of charges adopted by the Division was being adhered to by the Members, and if individual Members would give support in Court, if necessary.

(4) The PRESIDENT gave notice of a motion for the next meeting: "That a Division Fund be formed to help to defray the expenses of their Representative on the Council

* Received on August 11th.

of the R.C.V.S., but, should there be no Representative in any particular year, the proceeds for that year to be devoted to the Branch Fund, should this be formed."

. . . .

Lunch at the Hotel followed the business meeting, and the party then proceeded on a motor tour of the Solway Shore and Galloway hills. A stop was made at the noted farm of Knockbrex, on the kind invitation of Mr. J. Douglas Brown. They viewed the farm premises, which are well known all over Scotland and the Borders for their unusual and artistic construction. They were then shown the herd of "Tuberculin Tested" Belted Galloway cattle, among which are some of the best examples of the breed in the country. At the time of the visit many of them were being specially prepared for the "Royal" and "Highland" Shows and were therefore in perfect condition. The party proceeded by way of the Solway Shore, which many people consider compares very favourably with the Cornwall coast, and then *via* Gatehouse, Laurieston and Loch Ken to Dalry, where the company were entertained to tea by the President and Mrs. Young.

The return journey was made by the North Shore of Loch Ken to Castle Douglas and Kirkcudbright. All the party agreed that the outing had been ideal and well maintained the standard instituted last year, especially as the weather was again all that could be desired. Much of the success of the trip was undoubtedly due to the excellent arrangements made by Mr. McAlister.

Francis A. Davidson, *Hon. Secretary.*

Horses in London.

Under the above heading, the following letter appeared in *The Times* of September 15th:—

To the Editor of "The Times."

Sir,—Some time ago it was reported in the Press that the traffic control authorities of London were considering the position of horse-drawn traffic on the streets of London generally, relative to delays caused thereby, etc., and it was a great pleasure to see that they decided not to make a hurried decision, evidently struck by the weighty results that may follow any rushed or ill-made conclusion. Apart from the delay supposed to be caused and the relatively microscopic gain of time that might result (I say might, because it is very doubtful if any gain of time would actually result), any fair-minded person can see that the glut of motors cause their own delay. London is trying to absorb more motors than she is laid out to digest.

Horses handle goods on short journeys at the cheapest possible rate, and thus help to keep down the price of commodities to the London citizens and general public. Many councils in London use horses because they do the work cheaper and at the same time employ more men and thus give them the chance of earning an honest living and keeping rates down by keeping them off the dole. That is sound reasoning, and it brings me to my point.

It is not generally known that there are from 200,000 to 300,000 horses at work in commerce and used by city councils and corporations in Britain. Now, if the London authorities interfere with the horse-drawn traffic, it is fair to assume that some other cities will follow suit. What then is to become of the carters, the stable-hands, shoeing smiths, harness-makers and repairers, wheelwrights, painters, forage contractors, and the men they employ, and the families of this army of hard-working citizens? Because the food and forage these horses consume and use amounts to something like £8,000,000 of agricultural produce. The people thrown out of work would be anywhere between 100,000 and 200,000 if horses were dispensed with—a nice addition to the already great army of unemployed—and would thus burden our already heavily burdened ratepayers. London and our great cities have always been of the greatest assistance to agriculture through taking so many horses and so much corn and forage each year from the agriculturist, that I hope the powers that be will make no hurried decision on this momentous question, for its effects will go far deeper than any very doubtful and minute gain of speed could justify.

I am, Sir, yours very truly,

James Forshaw.

Hillside,
Sutton-on-Trent.

From The Veterinarian,

August, 1830.

Communications and Cases.

Pathological Facts and Observations.

By Mr. Castley, V.S., 12th Lancers.

No. III.

"I shall studiously avoid controversial discussions when they can lead to no practical results; and theory unsupported by experience I shall altogether reject."—Dr. Ballengall's Lectures.

"Let us ———
Try what the open, what the covert yield."

Of Strangles.

I have frequently heard it remarked by farmers, and also by other persons whose practical observations I consider at all times worthy of attention, that the period of strangles is often a much more trying and critical time for young horses than most people seem to have any idea of; that, when colts get well over this complaint, they generally begin to thrive and improve in a remarkable manner, or the contrary; that, in fact, it seems to effect some decided *constitutional change* in the animal. Often, when a young horse is looking sickly, delicate or thriftless, they will say, "he is breeding the strangles," or that "strangles is hanging about him, and he will not be better until he gets over that complaint."

Now I am inclined to think there is a good deal of truth in these remarks. And not merely because I think the remarks of practical persons are always entitled to some respect; but because I have often had occasion to notice something of the same kind myself. I have frequently seen young horses looking unkindly in their coats; exhibiting a general unhealthy appearance, with a disposition to cough and sore throat, and continuing in this state of obstinate thriftlessness for even months together, previously to showing what is commonly called strangles; as if there was a struggle in the system to throw off something that oppressed it, and which it wanted power, or had not sufficient vigour, to overcome. But the period of strangles once passed, I have often been struck with the remarkable change that has taken place in the condition of the same individuals, who generally then begin to thrive and improve rapidly.

When, therefore, we look upon strangles as something local, trivial, or scarcely deserving of much attention, we are, I think, taking but a very superficial view of the matter. Its constitutional nature may not, indeed, in most cases, be clearly developed; it may be something difficult to grasp, or even beyond our reach; yet, we should never forget that this forms an essential, nay, I may say, the only important part of its character.

Our imperfect knowledge of the real nature of this

disease has been admitted by some of our best veterinary writers. "All I know of its specific character," says Percivall, "is the universality of its attacks, the age of the subject, and the slight accompanying febrile derangement; even in these, its peculiar characters, it manifests great irregularity." Most of the older authors on farriery, however, and some of them appear to have possessed considerable talent for observation, looked upon the process of strangles as "discharging something obnoxious to the constitution of young horses, by which they are rendered more healthful than they were before." And White, who, I think, is by no means bad authority in matters of this kind, observes that, "when strangles occurs at grass, and goes through a regular form without the interference of art, it accomplishes the purpose for which it was designed, that of invigorating the constitution." My friend, Professor Dick, of Edinburgh, also remarks (in his lectures), that this is perhaps a much more complicated disease than is generally supposed; that, although it commonly terminates by an abscess under the jaw, yet it may, and occasionally does, give rise to collections of matter on other parts of the surface. He has noticed this taking place more especially about the tops of the shoulders, and in the neighbourhood of the axilla; and has sometimes seen a second formation of matter in the same part after a long interval, even that of a year.

(To be Continued.)

Defects in Dogs.

Malformations and Heredity.

To a recent issue of *The Times*, the Kennel Correspondent of that paper contributed the following article:—

It is not surprising that Darwin, in conducting his investigations, should have utilized the experience of breeders of small animals. He acknowledged the ability of men who were engaged in this pursuit. Among the facts brought to his notice was that albinism and deafness were closely correlated. A white cat with blue eyes was nearly always deaf, though a speck of colour in the fur was enough to spare it from the infirmity. He was also much interested in the marked disparity in size between the sexes in deerhounds. Most of the breeders of his day had to be content with reaping the fruits of experience, science giving them little practical aid. They had discovered empirically a good deal about the law of heredity without understanding its full implications. Pedigrees were the books they read.

After all these years it cannot be said with conviction that science helps us much in improving breeds of dogs, though it may explain things that were obscure and may point out the danger of pursuing a certain course. It has shown us, for example, that congenital deafness is transmissible. The union of two deaf parents will produce a considerable proportion of deaf progeny. Less than 20 years ago the disability was so common in white bull terriers that no experienced person ever thought of buying one without testing its hearing. Then the Bull Terrier Club took decisive action, asking its members to refrain from breeding from defective animals, and inserting in its rules a declaration of honour under which they bound themselves not to exhibit deaf dogs for competition.

The result has been most encouraging, deafness having largely disappeared. In the current issue of the *Bull Terrier Club Annual*, Dr. G. M. Vevers, the Hon. Secretary, makes some observations upon the subject, writing:—

The researches of Crew and others have put it beyond all doubt that the deafness associated with bull terriers and other animals lacking in pigment is a hereditary defect due to the degeneration or absolute absence of a small passage in the ear known as the cochlear duct. This form of deafness is also almost certainly a Mendelian recessive, and if we kill all our deaf, and do not breed from either deaf sires or deaf dams, deafness in bull terriers is bound to die a natural death within the course of the next 10 or 20 years. I would like to stress this point, as most bull terrier breeders do not seem to realise that in keeping or breeding from deaf dogs they are perpetuating the worst fault, barring absolute blindness, that a dog could possibly suffer from.

Another matter in which the law of inheritance also operates is causing discussion at the moment. It is known that certain breeds, notably chow chows and Pekingese, suffer from inverted eyelids, or entropion, to use the scientific word. Most authorities seem to be agreed that this malformation usually causes acute discomfort and sometimes leads to serious disease. Mr. A. Cornish-Bowden, M.R.C.V.S., who has specialised in eyes, states that in Pekingese, with more sensitive and larger eyes than the chow, the result of this defect is almost invariably ulceration of the cornea sooner or later, no matter how slight the inversion is. The trouble can be remedied by a slight operation, although, I believe, it may recur. That, however, does not prevent the possibility of the malformation being passed on to any puppies.

At the last meeting of the Kennel Club Council of Representatives, Mr. C. D. Rotch, a prominent chow breeder, proposed that inverted eyelids, unless remedied by veterinary operation, should be a disqualification for showing. There seem to have been certain satisfactory reasons for preventing the Kennel Club from acceding to this proposal, but at any rate it has had the effect of inducing the club to approach societies most concerned, suggesting that action should be taken to discourage breeding from dogs that have inverted eyelids. Should their views meet with acquiescence, breeders will have to exercise considerable self-denial, since it is understood that some of the best dogs have been operated upon, and it is further contended that the evil is only likely to reappear in a certain proportion of the puppies.

It is more than probable that the practice of in-breeding is responsible for the fixation and perpetuation of defects that might at one time have been apparent in an insignificant number of cases. Statistics have shown that in human beings consanguineous marriages greatly increase the probability of the inheritance of deafness, and there is no reason to suppose that the experience would not be similar in relation to lower animals.

Action of Tincture of Iodine on India-rubber Stoppers.

It was observed that tincture of iodine which had been kept for some time in a bottle with a rubber stopper produced only a yellow colouration of the skin, not the usual brown one. In order to study the action of tincture of iodine on rubber, various samples of rubber were placed in tincture of iodine contained in a glass-stoppered bottle. After 14 days the iodine content had decreased by 29 per cent. with formation of a corresponding amount of HI. Tinctures of iodine with and without KI were used, but the results were the same. It is chiefly the filling material of the rubber which acts on the iodine; zinc oxide and calcium carbonate used as filling material neutralise HI and pass as ZnI_2 and CaI_2 into the tincture. It is therefore obvious that rubber stoppers are quite unsuitable for bottles used for storing tincture of iodine. Corks are, of course, also attacked sooner or later, but they do not affect tincture of iodine at the same rate as rubber. Applying vaseline to glass stoppers of iodine bottles is not advisable, as there is interaction with the iodine.—H. R. Zenthen (*Farmaceutisk Tidende*, 1930, No. 14, through *Ph. Ztg.*, 75, 55, 810, Ex. *Pharm. Journ.*).

The deaths of a large number of horses and cattle owing to ragwort poisoning have been reported to Pembrokeshire Diseases of Animals Committee by the county veterinary surgeon, who appeals to all farmers to cut down the poisonous plant to prevent it seeding. A prominent farmer suggested that this weed was responsible for the unpleasant flavour of Pembroke butter, and advocated that the County Council should enforce their powers. Ragwort is a scheduled dangerous weed, and farmers who allow it to grow are liable to prosecution.—*North British Agriculturist.*

H.M. Stationery Office Publications.

The undermentioned have been published recently. Copies can be purchased though any bookseller, or directly from H.M. Stationery Office, at the following addresses:—London: Adastral House, Kingsway, W.C.2, and 28, Abingdon Street, S.W.1; Cardiff: 1, St. Andrew's Crescent; Manchester: York Street; Edinburgh: 120, George Street.

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Statutory Rules and Orders, 1930:—		
683. Dogs. Control of Dogs (Amendment) Order, dated August 14th, 1930	0 1	0 1½
Command Papers:—		
Cmd. [3667]. Ministry of Health. Eleventh Annual Report, 1929-30 ...	4 6	4 10

Flies and Swine Fever.

"Research work in America has proved how flies can carry the infection of swine fever from one farm to another. This finding is the result of ten years of investigational work, chiefly in Iowa," says *The Field*.

"By liberating flies that were coloured for later identification, it was learned that they had travelled as far 13 miles, going six miles in 24 hours. House flies followed a team two miles.

"According to Dr. C. N. McBride, of the United States Bureau of Animal Industry, if more of the Western farmers in the United States would bale as much straw as was needed and burn the rest of it, they would be doing a wise thing as far as swine fever is concerned. Wet straw and manure heaps make ideal breeding places for stable flies. Manure should be spread on the fields and ploughed in as soon as possible, rather than be allowed to accumulate in the farm yard."

Saltless Diet and Secretion of Gastric Juices.

It is generally assumed that a salt-free diet, which introduces into the human organism just the amount of sodium chloride naturally contained in the food, adversely affects the secretion of gastric juice, and in particular inhibits the formation of HCl. To find out the effect of a salt-free raw diet, experiments were carried out, but they did not prove any inhibition or disturbance, even in cases where the patients had been put on raw diet for months. On the contrary, the majority showed a higher acidity curve. The human organism adapts itself to a diminished supply of chlorides by a reduction of NaCl elimination with the urine to such an extent that a real chlorides deficiency of the tissues and juices never occurs. There is, therefore, no reason for the inhibition of HCl formation in the stomach. The stimulation of the gastric juice secretion is probably directly due to the juice of the raw fruit and vegetables.—Dr. K. Eimer (*D. Med. Wschrft.*, 1930, No. 24; through *Pharm. Ztg.*, 75, 51, 763, Ex. *Pharm. Journ.*).

Errata.—*Re* Abstract "Milk Fever Considered in the Light of Recent Researches," *Vet. Rec.*, Vol. X, 871, September 13th, 1930, the article appears in *Svensk Veterinar-tidskrift*, 1930, 161-180, not, as stated, in the *Skand: Vet.-tidskrf.* The Swedish title should read "Förlossningslamhet . . . undersökningar," not, as stated, "underökningar." Our abstractor desires to amend the first paragraph as follows:—"Gives a full review of the hypotheses pertaining to milk fever and the mechanism of its relief. Deals at length with the hypo-calcæmia theory as postulated by Dryerre and Greig, Little and Wright; also the hypo-glycæmia theory put forward by Widmark and Carlens subsequent to observations by a Canadian veterinarian."

. . . .

Mr. H. T. Matthews, of the Veterinary Department, City of Liverpool, informs us that he was not the contributor of the remarks attributed to him (*V.R.*, September 13th, Vol. X, No. 37, p. 863) in our report of the discussion on Mr. Downham's paper "The Intradermal Tuberculin Testing of Cattle," at the Corwen meeting of the North Wales Division, N.V.M.A. He was not present at the meeting, the speaker being Mr. John Matthews, of Anglesey.

The New Zoo at Whipsnade.

Reasons for its Construction.

"Sir Peter Chalmers Mitchell, Secretary of the Zoological Society, in an address to members of the Luton Rotary Club, said that he hoped the new Zoo at Whipsnade, Beds, would be open by next Whitsun," says the Luton Correspondent of *The Times*.

"The London Zoo, he said, was becoming too small, because of the increasing number of visitors, and because if they were going to keep animals in captivity they should give them the maximum amount of freedom and open air. In London they tried to keep a large number requiring heat and indoor accommodation, and thus they had to provide a large number of buildings of that kind, so that they came to the conclusion that they ought to have an extension of the grounds, which was impossible in London; and Whipsnade was the second or third place at which they looked.

'Whipsnade was, in his mind, an intermediate stage, a link in a much bigger scheme. Personally, he believed it was the duty of the present generation, all over the world, to preserve the existing animals of the world so far as it was possible. There were three ways of doing that. They had the intensive way, like the Zoo in London. The next thing was what they hoped Whipsnade was going to become—a place where the animals would be able to be shown far more in their natural conditions. The third stage was that there ought to be in every part of the Empire great open-air reserves where animals would be allowed to remain absolutely in their natural freedom.

Visitors Should be Enclosed.

"His image of the future of these national parks and reserves in Africa, India, and so on, was not that the animals should be enclosed, but that, if necessary, the visitors should be enclosed, that there should be covered ways going through these reserves where people could see the animals absolutely free and in their natural conditions.

"It had been said that Whipsnade was merely to be a sort of sanitary station, to which they were to send sick animals from London. It was to be nothing of the kind. What they did think was that at Whipsnade they would be able to give animals much more space and freedom, and that there would be a larger number of animals breeding down there, and that they would keep in London only selected animals in the pink of condition.

"There would be a constant exchange between the Zoo at Whipsnade and the Zoo in London. The new Zoo would be as free to the public as to the Fellows of the Society, and would be open on Sundays on payment, just as on weekdays, and for that reason they were laying it out on the scale which would hold crowds. The maximum comfortable capacity at the London Zoo was 20,000, but from the way the Whipsnade Zoo was laid out it should be able comfortably to hold 100,000, and to provide for that they were having five restaurants, scattered in different parts of the park. Round about each of these places would be land that could be used for picnics.

Arrangement of Animals.

"In relation to the animals, they were trying to arrange them in a series of large paddocks, with places for the public along the front of the paddocks, which would be completely surrounded in time by trees. There would be open paddocks with a background of trees, behind which they were going to make huts, cages, and dens for the animals. These would be entirely concealed from the public by trees. It would be possible, with electrical power from Luton, to provide them with heaters, which could be switched on from some central point when the weather made it necessary. He could not tell them exactly all the animals they were going to begin with at Whipsnade. They had already a certain number of bears, some cranes, and several kinds of deer, which had been breeding very well. They hoped in the course of this winter to make provision for elephants, camels, lions, tigers, and wolves, with a great many kinds of antelope and deer. They had

Notes and News.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

Oct. 6th.—N.V.M.A. Committee Meetings at 2 Verulam Buildings, W.C.1 :—Appointments, 2 p.m. ; Veterinary Officers' and Public Health, 2.30 p.m. ; Joint Meeting of Veterinary Officers and P.H. and Parliamentary Committees, 4 p.m. ; Parliamentary, 4.30 p.m. Special Committee *re* Appointment of Veterinary Surgeons to the Ministry of Health, 5.15 p.m.

Oct. 7th.—N.V.M.A. Committee Meeting, 2 Verulam Buildings, Gray's Inn, W.C.1 :—Organising, 10.30 a.m. ; Meeting of Deputation *re* Veterinary Advisory Officers, 11 a.m.

N.V.M.A. Council Meeting, 10 Red Lion Square, W.C.1, 2 p.m.

R.C.V.S. Committee Meetings, 10 Red Lion Square, W.C.1.

Oct. 8th.—R.C.V.S. (Examination and Registration).

Oct. 9th.—R.C.V.S. (Parliamentary and Registration). International Veterinary Congress ; Organising Committee.

Oct. 9th.—Meeting of the Lincolnshire and District Division, N.V.M.A., at Lincoln.

Oct. 10th.—R.C.V.S. (Library and Finance Committees). R.C.V.S. Council Meetings.

Personal.

Will.—Carter, Mr. Joseph Henry, F.R.C.V.S., of Avalon, St. Mark's Road, Henley-on-Thames (net personalty, £7,435), £10,076.

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Riding Accident.—His many friends in the profession in the South will learn with great regret that Mr. Ernest Wilkinson, M.R.C.V.S., of Witney, Oxon, met with a serious accident while riding recently. Mr. Wilkinson's horse reared and fell on him, breaking his thigh, and he was conveyed to the Radcliffe Infirmary.

Army Veterinary Service.

LONDON GAZETTE—WAR OFFICE—REGULAR ARMY.

RESERVE OF OFFICERS.

September 12th.—Lieut.-Colonel W. C. Lowe, O.B.E., having attained the age limit of liability to recall ceases to belong to the Reserve of Officers (August 1st).

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TERRITORIAL ARMY.

September 26th.—Lt. R. E. C. Bullen, to be Capt. (February 15th.)

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COMPLETING THE SCHEME OF TERRITORIAL ARTILLERY MECHANIZATION.

The mechanization of the Territorial artillery, which has been carried forward in sections during recent years, will be continued annually until the mechanization is complete. The detail was announced with the Army Estimates last March.

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already a small herd of bison, and were going to have a herd of white marked cattle, given by the Duke of Bedford. There would also be many different kinds of birds. By next Whitsuntide the Zoo would not be anything like completely ready, but they hoped there would be enough to interest the public."

Foot-and-Mouth Disease.

A second outbreak of foot-and-mouth disease in the North Riding of Yorkshire was confirmed by the Ministry of Agriculture, last week-end, on a farm at Bilsdale, Stokesley. The first outbreak, which occurred on a farm five miles from the present one, was confirmed on September 20th.

Obituary.

THE LATE MR. RICHARD JONES, M.R.C.V.S.

We are grieved to learn that the practitioner whose notes filled our Clinical Section last week, Mr. Richard Jones, of Towyn, has passed away, and are glad to publish the following appreciative notice which has reached us from one who knew him well.

" On Friday we laid our friend, Dick Jones, to rest, within 200 yards of his farm (inappropriately named ' Pall Mall.') He graduated in April, 1882, a month before he attained his majority, and settled down in his charming native parish. He had latterly suffered from heart trouble and for the last month from an affection of the eyes, but was out on Saturday and, whilst testing some bulls, collapsed in the byre and died on Monday evening.

"It is sad to read in to-day's *Record* a characteristic clinical article from his pen. ' Uncle Dick,' as he was affectionately known to his intimate friends, was undoubtedly the best surgeon in the Principality, though he took to the surgical side rather late in life. He was painstaking and his methods were original. For example, he would cast a colt for amputation of the tail—which he always did by the " flap " method—and operate on umbilical hernia in the standing position.

"Richard Jones was the pioneer of cryptorchid castration in Wales, and when asked for the secret of his success would say : ' Be scrupulously clean and avoid the bruising of tissues.' He cared little for antiseptics, but was lavish in the application of soap and water.

" His 70 acre farm, situated half a mile from the town, seemed always to be stocked, partly with his own animals, and a proportion of patients sent in for operations. Nothing gave the writer more pleasure than to make a 'busman's holiday of the 60 mile trip to commune with him and see and discuss his cases.

" He had an utter loathing of humbug in any sphere of life and was, chiefly on that account, a welcome debater at our professional meetings.

" Our friend was a good judge of all animals and was Chief Veterinary Officer of the Royal Welsh Agricultural Society for 26 years. Failing health forced him to resign this year, and the writer had the honour of being appointed to succeed him.

" We shall miss ' Uncle Dick.' We have lost a genial companion, a wise counsellor, and a sincere friend.

" He had a wonderful tribute paid him by all classes at the interment on Friday. His profession was represented by Mr. J. Rhydwen Jones, M.R.C.V.S. (an old fellow-student), Mr. J. H. Wynne, F.R.C.V.S. (President of the North Wales Division, N.V.M.A.), Mr. W. O. Jones, M.R.C.V.S., M.P.S., and Mr. L. W. Wynn Lloyd, J.P., F.R.C.V.S."

London's Lord Mayor.

Tuesday's announcement of the election of Alderman Phené Neal as Lord Mayor of the City of London will have been read with the greatest pleasure by the many members of the profession who have the privilege of knowing him and who hold him in high regard for his sterling work in the promotion of public health, with special reference to meat inspection. The new Lord Mayor has for many years identified himself closely with the profession, and has been a welcome guest at many of its conferences and social functions.

At a luncheon at Guildhall given to meet the Lord Mayor and the Sheriffs and other distinguished guests, the host was Sir Frederick Green, who was chairman of the Special

Reception Committee which carried out the arrangements for the entertainment given by the City Corporation at Guildhall in August last to the delegates attending the International Veterinary Congress in London.

Sir John M'Fadyean, formerly Principal of the Royal Veterinary College, submitted the civic toast.

Sir Frederick Green gave the toast of "The Guests."

Major-General Sir John Moore replied.

The Lord Mayor presented Sir Frederick Green with a silver salver as a mark of appreciation of his services by his colleagues, and thanked him on behalf of the Corporation for the important part he had played in making the conversazione a success.

Sir Frederick Green, in acknowledgment, thanked the Town Clerk (Sir James Bell) and Mr. A. T. Roach (Clerk to the Committee) for their help.

The company also included Principal F. T. G. Hobday, Lt.-Col. T. Dunlop Young, and Dr. F. Bullock, Secretary and Registrar of the Royal College of Veterinary Surgeons.

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Calcium and Milk Fever.

To the Editor of the Veterinary Record.

Sir,—In further reply to Mr. R. H. Smythe's letter dated September 20th, 1930, may I be allowed to explain what appears to be a feature of certain milk fever cases, of which sight is sometimes lost; namely, the fact that lactation need not have commenced?

The possession of a secreting mammary gland is *not* essential in respect of cows suffering from milk fever, although *usually* the cells are functioning. No two cows possess calcium store houses under similar states of depletion, and further, every cow's mechanism for the upkeep and utilisation of that store of lime is in a different state of activity. Anatomically and physiologically every cow differs—some are of Pharaoh's lean kine and others the reverse. Consequently, under present-day dairying conditions certain cows may habitually get milk fever whilst others never have an attack.

The important point to be realised is that the available supply of utilisable calcium is limited because of certain losses. These may be *via* the urine, fæces, saliva, fœtus, formation of caseous tuberculous deposits, or by the secretion of colostrum, milk, etc. Milk secretion, however, is only one of the many exits from the body by which lime may be lost. When the daily excretion of calcium is greater than the amount metabolised from the food, sooner or later the storehouses fail, either directly because of this, or because the mechanisms which have the power to unlock the storehouses are faulty. This may be due to circulating toxins, endocrine disturbances, or vitamin deficiency, etc. Under such circumstances tetany occurs, which is one of the characteristic features of milk fever.

Replying to Mr. Hoban's query (9/9/30), Dr. J. Russell Greig, in one of his earlier brochures (about 1926), mentions in his "predisposing causes" that an easy calving is quite often associated with the onset of milk fever. The explanation offered was that the sympathetic production of adrenalin in such cases is low; only in protracted and difficult calving cases where there is undue fear, fright, excitement, etc., will there be a high outpouring of adrenalin. This hormone has the power to detoxicate, indirectly, certain poisons, and at that time guanidine was believed to be the type of toxin implicated. In addition, adrenalin will liberate more glucose into the blood stream, the blood pressure is raised, the heart fortified, and thus the animal has better resistance against milk fever. Whether adrenalin can affect the concentration of blood calcium is still uncertain, but it is interesting to note that certain practitioners frequently give a subcutaneous dose of 5 to 10 c.c. of adrenalin after udder inflation.

Yours faithfully,

W. P. Blount.

31, Walbrook Road,
Derby.
September 27th, 1930.

Diseases of Animals Acts, 1894 to 1927.
SUMMARY OF RETURNS.

Period.	Anthrax.		Foot-and-Mouth Disease.		Glanders (including Farcy).§†		Parasitic Mange.§		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks confirmed.	Animals attacked.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1 to 15 Sept., 1930	17	20	5	158	—	—	4	7	7	73	32
Corresponding period in—											
1929 ...	16	20	3	744	—	—	1	2	1	93	42
1928 ...	23	24	—	—	—	—	3	4	14	38	24
1927 ...	16	20	4	356	—	—	12	15	12	57	19
Total 1 Jan. to 15 Sept., 1930	273	300	5	158	—	—	172	259	293	1,776	738
Corresponding period in—											
1929 ...	322	404	26	2,639	—	—	163	329	373	1,625	961
1928 ...	400	459	107	8,929	—	—	230	442	351	1,142	590
1927 ...	302	364	31	2,790	—	—	283	470	432	1,247	589

Note.—The figures for the current year are approximate only.

† Including outbreaks in recently imported animals.

§ Excluding outbreaks in Army Horses.